

Flavorful Higgs bosons at the LHC

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LHC searches for extended Higgs sectors have so far focused on scenarios that conserve flavor i.e. the additional Higgs bosons couple to fermions in a flavor diagonal way and the signatures of the additional Higgs bosons dominantly involve third generation fermions. Much of the the focus of LHC searches have been on Type I and Type II two Higgs doublet models (2HDMs). However, there may exist models that break flavor conservation and lead to very different and distinct signatures that are missed if we only focus on flavor conserving models. In this talk I will present a particular 2HDM that breaks flavor conservation and features collider signatures that may dominantly involve second generation fermions rather than third generation fermions, as well as flavor violating signatures. Current LHC searches are insensitive to this kind of model, and I will present the novel collider signatures that can be expected. Along the way, we will see how this model can address the SM flavor puzzle, and explore the effects on low energy flavor processes.

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